

## Math 1010 – Exam 4 Review

Simplify using only positive exponents. Leave the answer in exponential notation.

1.  $(4x^{-2}y^{-7})(5xy^{-3})$

Divide and simplify.

2.  $\frac{36a^{-2}b^5}{4a^{-6}b^9}$

Simplify. Write the answer using positive exponents only. Leave the answer in exponential notation.

3.  $\left(\frac{3x^2y^{-5}}{x^{-6}y^2}\right)^{-2}$

Simplify. Assume that variables can represent any value.

4.  $\sqrt{81x^2}$

5.  $\sqrt{64y^4}$

Determine the domain of the function. Express your answer in interval notation.

6.  $f(x) = \sqrt[3]{x+5}$

7.  $f(x) = \sqrt[4]{2x-6}$

For the given function, find the indicated function value, if it exists.

8. For  $f(x) = \sqrt[3]{x-5}$ , find  $f(-22)$ .

9. For  $f(x) = \sqrt[4]{x-5}$ , find  $f(-620)$ .

Write an equivalent expression using radical notation and, if possible, simplify. Assume that even roots are of nonnegative quantities.

10.  $(x^5y^6)^{1/7}$

11.  $(4x^6)^{3/2}$

Rewrite using exponential notation. Assume that even roots are of nonnegative quantities and that all denominators are nonzero.

12.  $(\sqrt[5]{6xy})^3$

13.  $\sqrt[4]{\frac{ab^3}{7}}$

Use the laws of exponents to simplify. Do not use negative exponents in the answer. Assume that even roots are of nonnegative quantities and that all denominators are nonzero.

14.  $4^{4/5} \cdot 4^{1/3}$

15.  $(x^{-2/3}y^{3/8})^{1/2}$

Multiply.

16.  $\sqrt{6q}\sqrt{5p}$

Simplify. Assume that no radicands were formed by raising negative numbers to even powers.

17.  $\sqrt{12x^5y^4}$

18.  $\sqrt[4]{x^{12}y^9z^{27}}$

Find a simplified form of  $f(x)$ . Assume that  $x$  can be any real number.

19.  $f(x) = \sqrt{36(x-7)^2}$

Divide and, if possible, simplify. Assume all variables represent positive real numbers.

20.  $\frac{\sqrt{48xy^5}}{\sqrt{6x}}$

Rationalize the denominator. Assume all variables represent positive numbers.

21.  $\sqrt{\frac{75}{x}}$

22.  $\sqrt[3]{\frac{7}{4y}}$

Add or subtract. Simplify by combining like radical terms, if possible. Assume all variables and radicands represent nonnegative numbers.

23.  $8\sqrt{3} - 10\sqrt{27}$

24.  $5\sqrt[4]{x^6} - 6x\sqrt[4]{x^2}$

Multiply.

25.  $\sqrt{3}(\sqrt{12} - \sqrt{3})$

26.  $(\sqrt{7} + 2)(\sqrt{5} - 4)$

Rationalize the denominator.

27.  $\frac{5 - \sqrt{3}}{5 + \sqrt{3}}$

Divide and, if possible, simplify. Assume all variables represent positive real numbers.

28.  $\frac{\sqrt[4]{x}}{\sqrt[3]{x^2}}$

Solve.

29.  $\sqrt{4x} + 3 = 8$

30.  $y^{1/3} + 3 = -1$

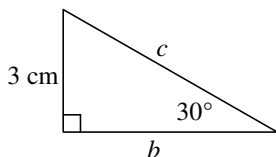
31.  $\sqrt{x+2} + \sqrt{3x+4} = 2$

Solve the problem. If necessary, round to the nearest tenth.

32. On a sunny day, a tree and its shadow form the sides of a right triangle. If the hypotenuse is 45 m long and the tree is 41 m tall, how long is the shadow?
33. A diagonal crosswalk at an intersection of State and Main is the hypotenuse of a triangle in which crosswalks across each street are the legs. State is 32 ft wide and Main is 21 ft wide. How much shorter is the distance traveled by pedestrians using the diagonal crosswalk rather than using both crosswalks that form the legs of the triangle?

Find the missing length(s) in the right triangle. If necessary, round to the nearest tenth.

34.



Find the distance between the pair of points. Give your answer in exact form and where appropriate find an approximation to three decimal places.

35.  $(2, -4)$  and  $(-5, 3)$

Find the midpoint of the segment with the given endpoints.

36.  $(2, -5)$  and  $(-1, -9)$

Express in terms of  $i$ .

37.  $\sqrt{-25} + \sqrt{-81}$

38.  $-\sqrt{-12}$

Multiply and simplify.

39.  $\sqrt{-16} \cdot \sqrt{-49}$

Perform the indicated operation and simplify. Write the answer in the form  $a + bi$ .

40.  $(4 + 2i) + (3 - 6i)$

41.  $(4 + 2i) - (3 - 6i)$

42.  $7i(4 + 2i)$

43.  $(4 + 2i)(3 - 6i)$

44.  $(3 - 6i)^2$

45.  $(3 + 6i)(3 - 6i)$

46.  $\frac{4 + 2i}{3 - 6i}$

Find the power of  $i$ .

47.  $i^{32}$

48.  $i^{21}$

49.  $i^{42}$

50.  $i^{39}$